

Figure S1: Typical IRSL (140 °C) and MET-pIRIR (170─260 °C) decay curves for one aliquot of sample ZWB-OSL-17-2.



Figure S2: The regenerative-doses Lx/Tx signals (normalized to unity at 480 Gy) measured at 260-140 °C stimulation temperatures used to construct the individual dose-response curves plotted against the SGCs for samples ZWB-OSL-7-2 to -18-1. Each data point represents one aliquot, and the corresponding standard errors are smaller than the size of the symbols.



Figure S3: pIRIR260 °C De distributions of individual aliquots of K-feldspar from samples ZWB-OSL-7-1 to -18-1 measured, respectively. The gray bands are centered on their central age model (CAM) values. The values of n refer to the number of measured aliquots.

**Table S1**

Single-aliquot equivalent doses (De) and ages for K-feldspar samples from the ZWB site.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | | De, Gy | | | |  | Age, ka | | | |  |
| IR 140 | MET-pIRIR 170 | MET-pIRIR 200 | MET-pIRIR 260 |  | IR 140 | MET-pIRIR 170 | MET-pIRIR 200 | MET-pIRIR 260 |  |
| ZWB-OSL-7-2 | 435 ± 14 | | 751 ± 18 | 831 ± 21 | 850 ± 23 |  | 134 ± 8 | 207 ± 11 | 229 ± 13 | 234 ± 13 |  |
| ZWB-OSL-10-1 | 421 ± 13 | | 739 ± 18 | 808 ± 20 | 853 ± 26 |  | 132 ± 8 | 206 ± 12 | 225 ± 13 | 237 ± 14 |  |
| ZWB-OSL-11-1 | 423 ± 14 | | 747 ± 18 | 818 ± 20 | 841 ± 23 |  | 137 ± 8 | 214 ± 12 | 234 ± 13 | 240 ± 14 |  |
| ZWB-OSL-13-1 | 437 ± 18 | | 795 ± 27 | 876 ± 31 | 894 ± 30 |  | 145 ± 10 | 233 ± 15 | 257 ± 17 | 262 ± 17 |  |
| ZWB-OSL-14-1 | 445 ± 17 | | 768 ± 23 | 850 ± 26 | 881 ± 41 |  | 149 ± 10 | 227 ± 14 | 251 ± 15 | 260 ± 18 |  |
| ZWB-OSL-14-2 | 412 ± 13 | | 718 ± 23 | 803 ± 23 | 782 ± 23 |  | 138 ± 8 | 213 ± 13 | 238 ± 14 | 232 ± 14 |  |
| ZWB-OSL-15-1 | 448 ± 15 | | 817 ± 27 | 915 ± 27 | 932 ± 27 |  | 135 ± 8 | 220 ± 13 | 246 ± 14 | 251 ± 14 |  |
| ZWB-OSL-16-2 | 467 ± 14 | | 820 ± 26 | 888 ± 27 | 965 ± 28 |  | 151 ± 9 | 236 ± 14 | 255 ± 15 | 277 ± 16 |  |
| ZWB-OSL-16-3 | 462 ± 14 | | 812 ± 25 | 889 ± 27 | 975 ± 32 |  | 150 ± 9 | 234 ± 14 | 256 ± 16 | 281 ± 18 |  |
| ZWB-OSL-17-1 | 489 ± 15 | | 841 ± 28 | 913 ± 28 | 1011 ± 30 |  | 154 ± 9 | 235 ± 15 | 255 ± 15 | 283 ± 17 |  |
| ZWB-OSL-17-2 | 475 ± 14 | | 828 ± 23 | 903 ± 23 | 965 ± 29 |  | 151 ± 9 | 234 ± 14 | 255 ± 15 | 273 ± 16 |  |
| *MAR Lx/T1 \** | *626 ± 35* | | *907 ± 51* | *947 ± 58* | *944 ± 57* |  | *177 ± 13* | *256 ± 20* | *268 ± 21* | *267 ± 21* |  |
| *MAR Lx/T2 \** | *667 ± 39* | | *964 ± 46* | *997 ± 48* | *978 ± 44* |  | *188 ± 15* | *272 ± 19* | *282 ± 20* | *277 ± 19* |  |
| *MAR T1/T2 \** | *1127 ± 1088* | | *1274 ± 787* | *1129 ± 432* | *956 ± 194* |  | *319 ± 308* | *360 ± 223* | *319 ± 123* | *270 ± 57* |  |
| ZWB-OSl-18-1 | 469 ± 16 | | 823 ± 24 | 893 ± 27 | 954 ± 39 |  | 158 ± 10 | 245 ± 15 | 266 ± 16 | 284 ± 19 |  |

\* The De values and ages for sample ZWB-OSL-17-2 based on the MAR Lx/T1, Lx/T2 and T1/T2 signals measured at 140, 170, 200 and 260 ºC stimulation temperatures.